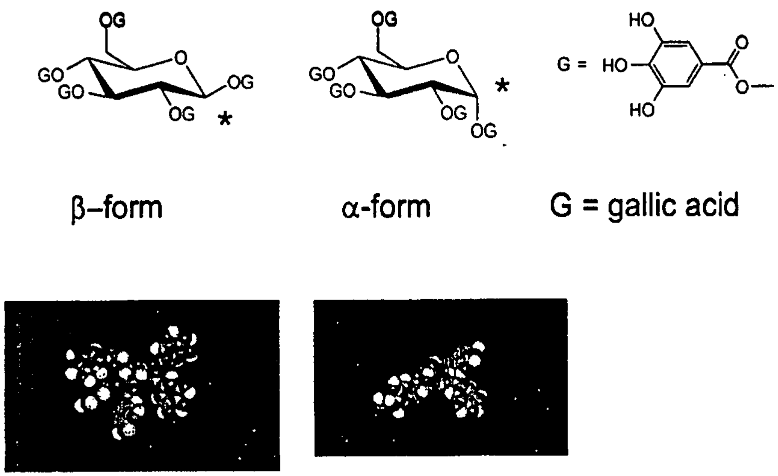
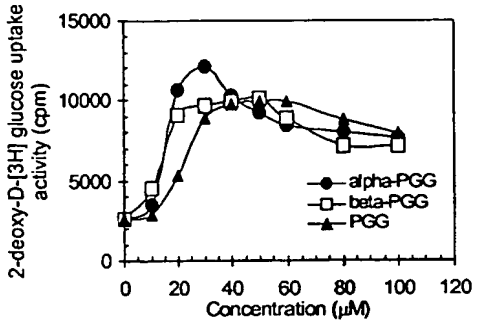


Fig. 1. Structure of penta-O-galloyl-D- glucose (PGG).
PGG consists of a glucose core that is covalently linked to five gallic acids through ester bonds. With two possible configurations at carbon 1(*) of glucose, two anomers of PGG exist. Computer simulated PGG conformations indicate that β-PGG may be more symmetrical (thus less polar) than α-PGG.

A


2-deoxy-D-[3H] glucose uptake activity (cpm)
15000
10000
5000
0
0 20 40 60 80 100 120
Concentration (μM)
alpha-PGG
beta-PGG
PGG

B

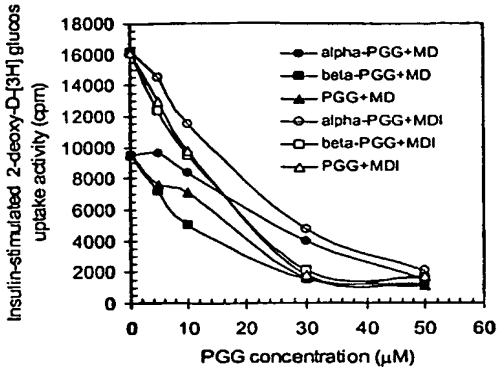

Insulin-stimulated 2-deoxy-D-[3H] glucos uptake activity (cpm)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0 10 20 30 40 50 60
PGG concentration (μM)
alpha-PGG+MD
beta-PGG+MD
PGG+MD
alpha-PGG+MDI
beta-PGG+MDI
PGG+MDI

Fig. 2

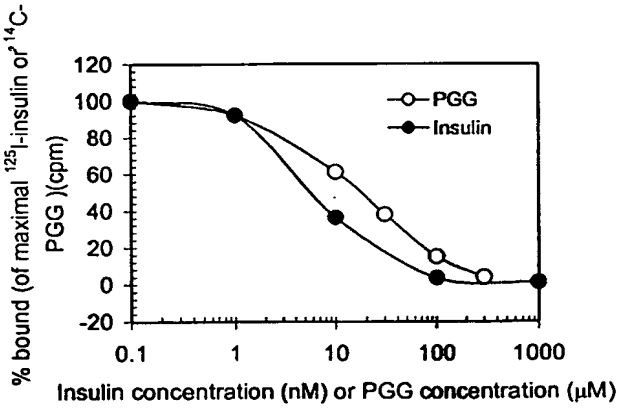

% bound (of maximal 125I-insulin or 14C-PGG)(cpm)
120
100
80
60
40
20
0
-20
0.1 1 10 100 1000
Insulin concentration (nM) or PGG concentration (μM)
PGG
Insulin

Fig. 3

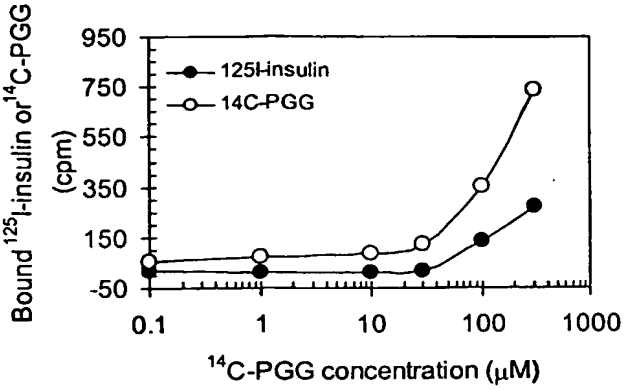

Bound ^{125}I-insulin or ^{14}C-PGG (cpm)
950
750
550
350
150
-50
125I-insulin
14C-PGG
0.1
1
10
100
1000
^{14}C-PGG concentration (μM)

Fig. 4

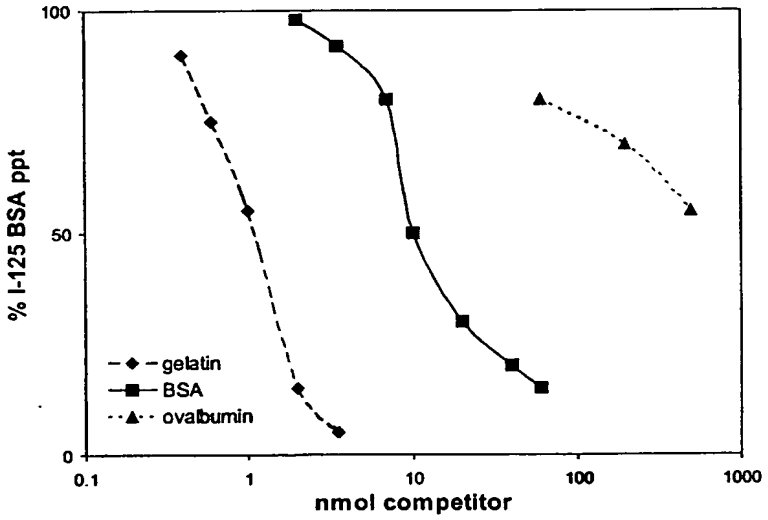

% I-125 BSA ppt
100
50
0
gelatin
BSA
ovalbumin
0.1
1
10
100
1000
nmol competitor

Fig. 5

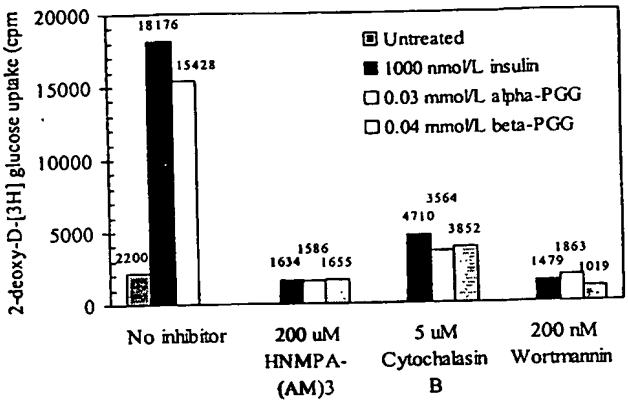


Fig. 6

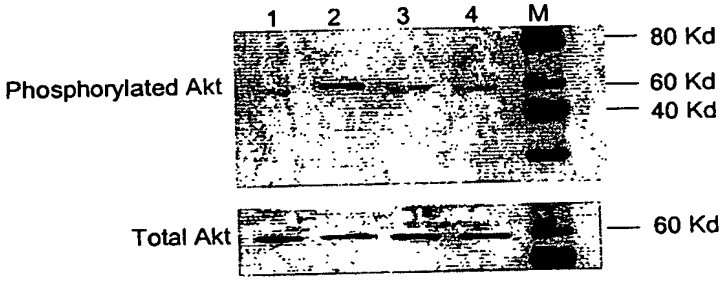


Fig. 7

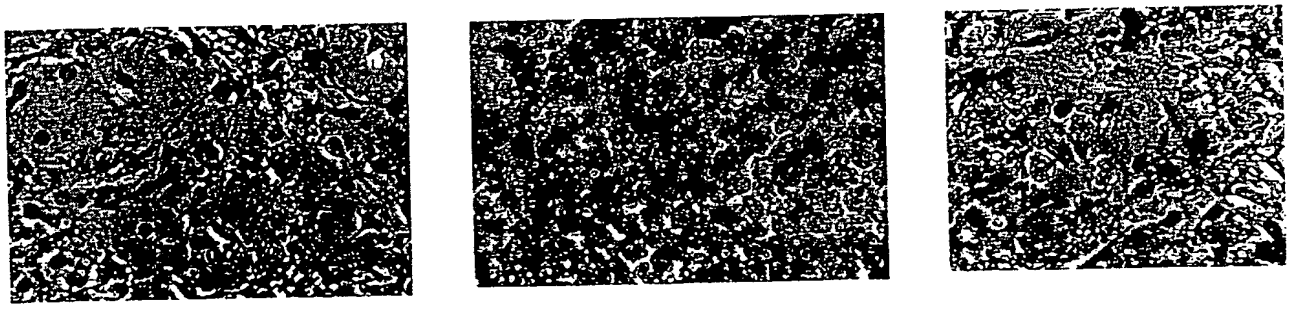


Fig. 8

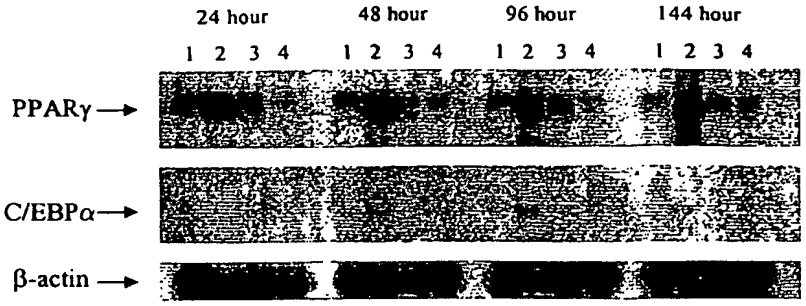


Fig. 9

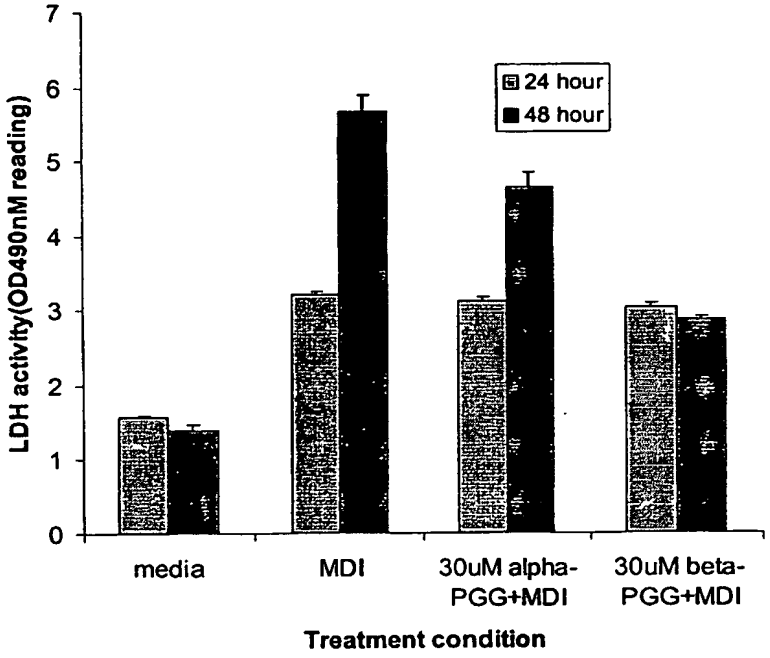


Fig. 10

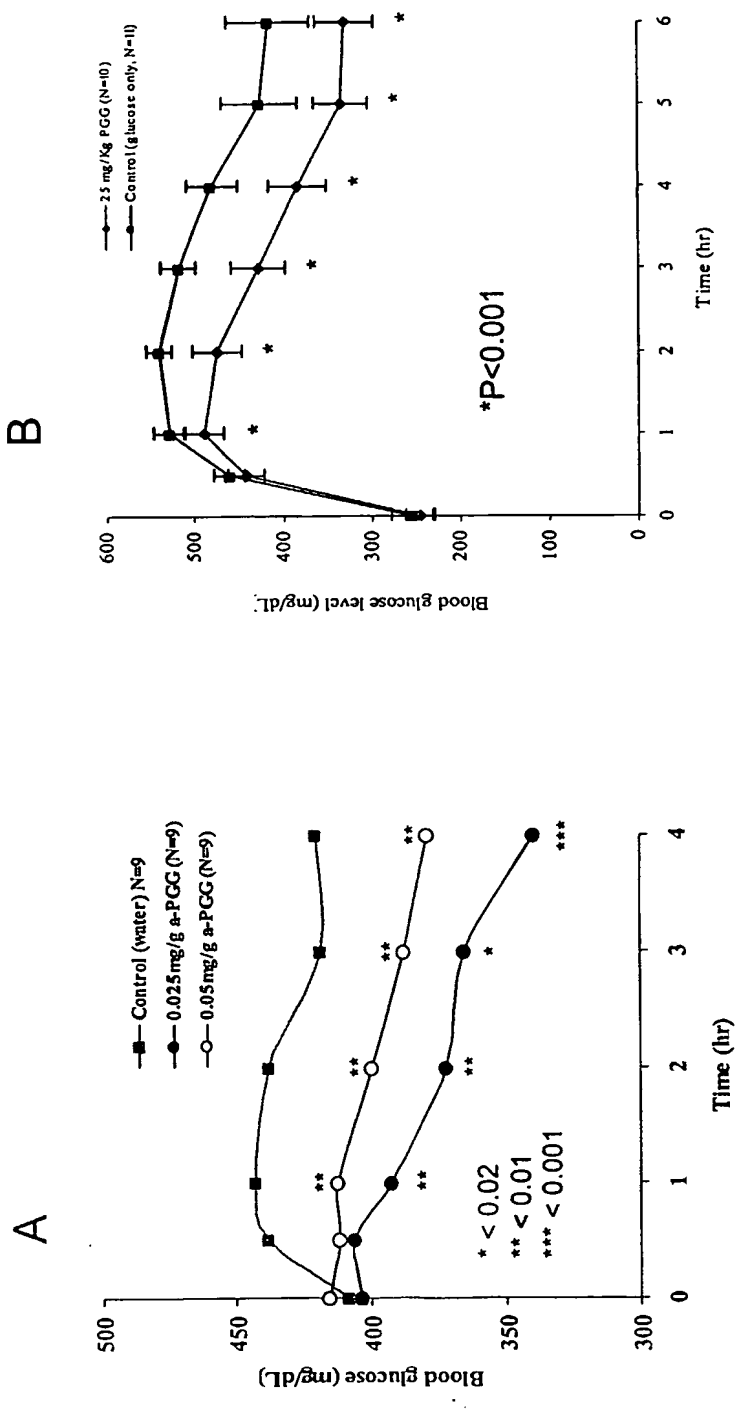


Fig 11. Hypoglycemic effects of PGG in db/db and ob/ob mice. Various doses of α-PGG were orally delivered without glucose to db/db mice (A) or with glucose to ob/ob mice (B) mice. At different times post the delivery, glucose was determined in samples from tail blood.

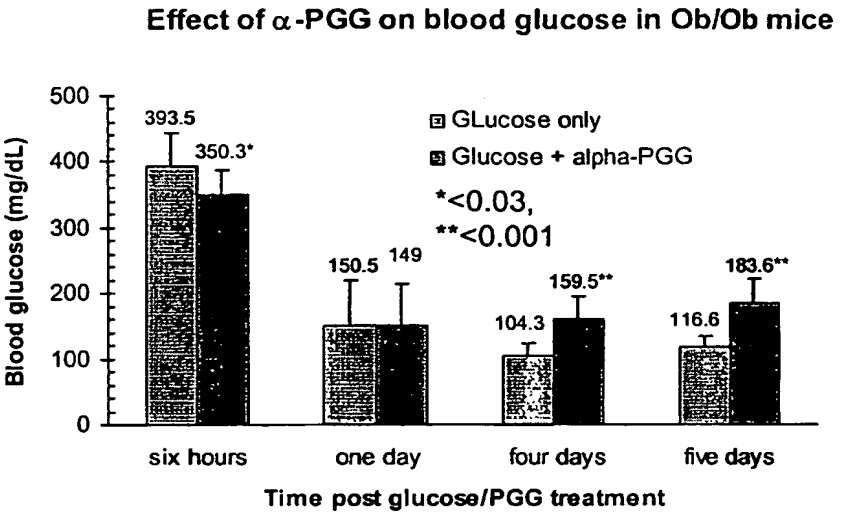
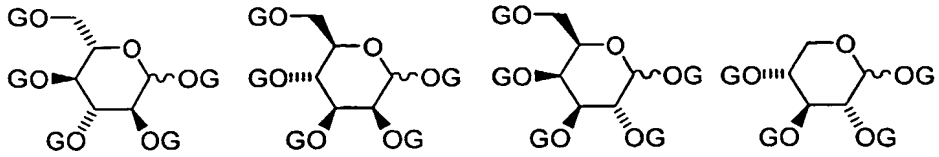
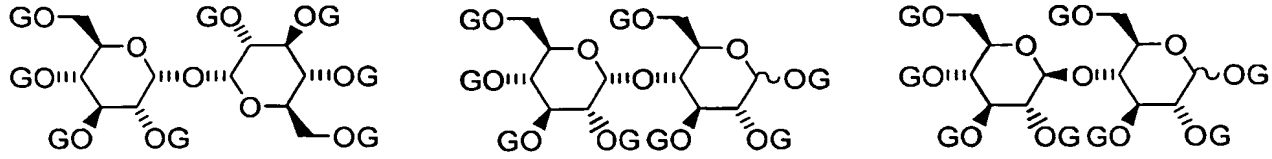


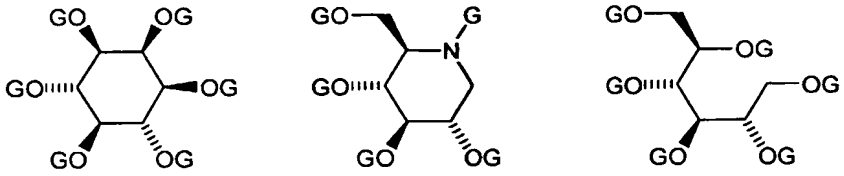
Fig. 12



L-Glucose D-Mannose D-Galactose D-Xylose



D-Trehalose D-Maltose D-Cellobiose



myo-Inositol Deoxynojirimycin D-glucitol

Fig. 13

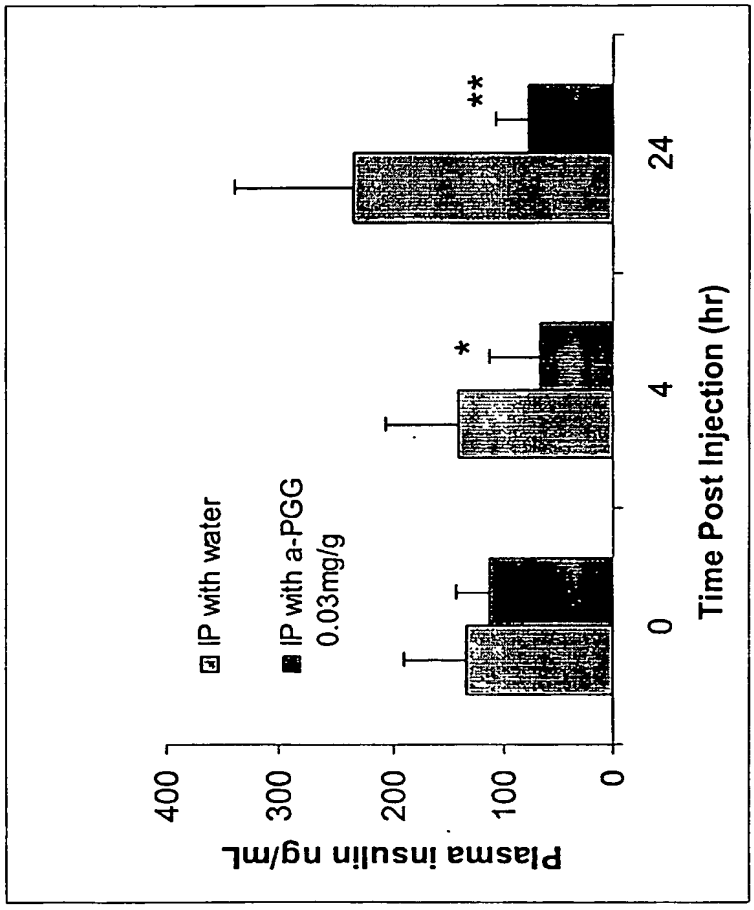


Fig 14. PGG reduces plasma insulin levels in ob/ob mice.

Diabetic and obese ob/ob mice were injected i.p. with either water or α-PGG. Plasma from each mouse was isolated at various times post injection and was measured for insulin levels. * $P < 0.03$, ** $P < 0.005$.

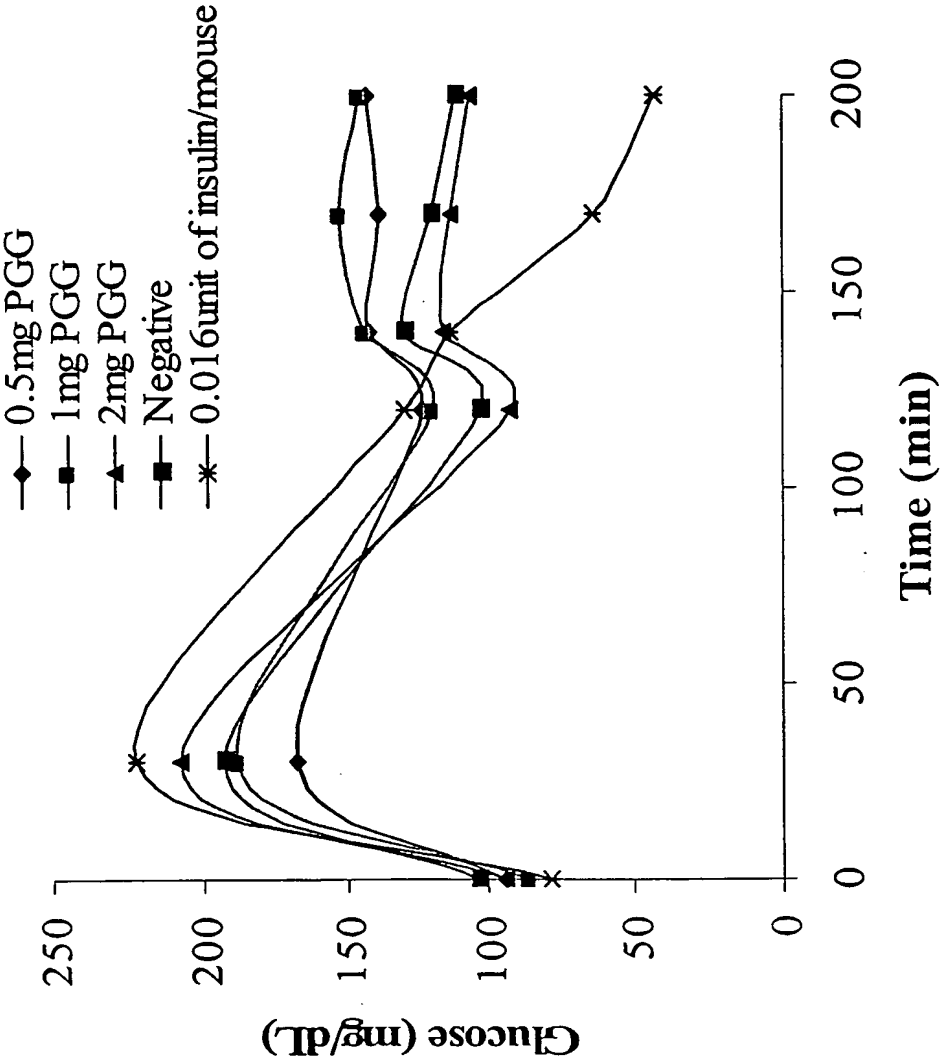

0.5mg PGG
1mg PGG
2mg PGG
Negative
0.016unit of insulin/mouse
Glucose (mg/dL)
250
200
150
100
50
0
0
50
100
150
200
Time (min)

Fig. 15